

WE CLAIM

1. An improved process for the preparation of a cellulose solution for spinning of fibres, filaments or films there from comprising in the steps of:
  - i) activating cellulose in a mixture containing said cellulose, tertiary amine oxide solvent and water for a period sufficient to allow a swelling of the cellulose by introduction therein of water present in said mixtures, the temperature of said activation step and concentration of solvent being such that the solvent is not converted into its monohydrate state during the step of activation;
  - ii) the cellulose mixture being subjected to the steps of dissolution of cellulose in the solvent by heating for removal of water so as to convert the solvent into at least its monohydrate form so as to cause a dissolution.
2. A process as claimed in claim 1, wherein an activator is added to said mixture, said activator selected from Glycols and Glymes.
- 20 3. A process as claimed in claim 1, wherein said amine oxide is a cyclic tertiary amine oxide, preferably N-Methyl Morpholine N-Oxide (NMMO).
4. A process as claimed in claim 1, wherein said cellulose is selected from rayon pulp and cotton linter pulp.
- 25 5. A process as claimed in claim 1, wherein said solvent used to form the mixture contains 40 - 70% NMMO in water.
- 30 6. A process as claimed in claim 5, wherein said aqueous NMMO is present in 50-65%.

7. A process as claimed in claim 1, wherein the step of activation is carried out for a period of 20-60 minutes and preferably for 30-40 minutes.
- 5        8. A process as claimed in claim 1, wherein the temperature of said activation step is maintained in the range of 70°-115°C, and preferably at 30° to 90°C.
- 10        9. A process as claimed in claim 1, wherein the step of dissolution comprises on heating the activated mixture at a temperature of 70° to 120°C, and preferably at 80° to 105°C.
- 15        10. A process as claimed in claim 1, wherein the step of dissolution of the activated mixture is carried out by heating under reduced pressure.
- 20        11. A process as claimed in claim 1, wherein the step of dissolution is carried out for 40 to 150 minutes.
- 25        12. A process as claimed in claim 2, wherein said activator is present in an amount of upto 3% by weight of the cellulose.
13. A process as claimed in claim 1, wherein an inorganic additive selected from ammonium chloride, calcium chloride, alkalies, glymes and glycols is added to the mixture for the step of activation.
14. A process as claimed in claim 1, wherein a cellulose solution containing 7-28% cellulose, 65-80% NMNO and 5-15% water, is obtained.

15. An improved process for preparation of a cellulose solution for spinning of fibres, filaments or films therefrom substantially as herein described.
- 5      16. An improved process for making cellulose fibres, filaments or films which comprises in the steps of:
- i) activating cellulose in a mixture containing said cellulose, tertiary  
10     amine oxide solvent and water for a period sufficient to allow a  
swelling of the cellulose by introduction therein of water present in  
said mixture, the temperature of said activation step and  
concentration of solvent being such that the solvent is not  
converted into its monohydrate state during the step of activation;
- 15     ii) the cellulose mixture being subjected to the steps of dissolution of  
cellulose in the solvent by heating for removal of water so as to  
convert the solvent into at least its monohydrate form so as to  
cause a dissolution.
- 20     iii) the cellulose-Amine oxide solution containing 7-28% cell, 65-80%  
NMMO and 5-15% water;
- iv) extruding the cellulose solution as fibres, filaments or film using dry  
jet-wet spinning method which is stretched in air gap of 5-1000 mm  
25     to develop molecular orientation;
- v) regenerating the spun filaments in an aqueous spin bath containing  
1-40% NMMO at temperature of 5-60 deg. C. The shaped articles  
are washed free of amine oxide, bleached, finished and dried.

17. A method as claimed in claim 15, wherein the cellulose - amine oxide solution is passed through a homogenizer to improve homogeneity of the dope.
- 5      18. A method as claimed in claim 15 in which the cellulose solution is extruded through spinnerettes and passed through an air travel and then into water containing amine-oxide solution to regenerate the fibres or filaments from which the solvent is recovered, purified and recycled.

10